

**III B. Tech I Semester Regular Examinations, November - 2015**  
**ENGINEERING GEOLOGY**  
 (Civil Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answering the question in **Part-A** is compulsory  
 3. Answer any **THREE** Questions from **Part-B**  
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**PART -A**

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|---|--|------|
| 1 | a) Write a detailed note on physical weathering.                         | [3M] |
|   | b) What is metamorphic rock? Discuss the various agents of metamorphism. | [4M] |
|   | c) Discuss the effect of faulting on various engineering projects.       | [4M] |
|   | d) How are earthquakes classified? Explain their causes.                 | [3M] |
|   | e) Describe the electrical resistivity method of site investigation.     | [4M] |
|   | f) Give an account of geological investigation of Dam site.              | [4M] |

**PART -B**

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|---|---|------|
| 2 | a) Write a note on geological work of river.  | [4M] |
|   | b) Give a brief account of the importance of geology in civil engineering. Explain your answer by giving suitable example.            | [8M] |
|   | c) Define weathering. Add a note on engineering importance.   | [4M] |
| 3 | a) Explain physical properties of Quartz mineral.   | [3M] |
|   | b) Explain how are the sedimentary rocks formed? Describe the various structures present in the rocks.                                | [8M] |
|   | c) Define the following terms:<br>i) Hardness, ii) Luster, iii) Fracture, iv) Cleavage.   | [5M] |
| 4 | a) Explain, with neat sketches, the principal types of Faults as recognized on the basis of apparent movement and mode of occurrence. | [8M] |
|   | b) How are folds classified? Describe different types of folds.   | [8M] |
| 5 | a) Explain the following: i) Aquifer, ii) Aquiclude and iii) Hydrological cycle.  | [8M] |
|   | b) Effects enumerate the classification and causes of landslides.   | [8M] |
| 6 | a) Write the importance of seismic refraction methods in civil engineering.   | [8M] |
|   | b) Describe the importance of Electrical Resistivity studies in civil engineering.  | [8M] |
| 7 | a) Discuss the influence of structural attitudes of sedimentary rocks on dam stability.   | [8M] |
|   | b) Explain the influence of geological structures, water table, and scope for preventive leakage for successful reservoir.            | [8M] |

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**PART -A**

- |      |  |      |
|------|--|------|
| 1 a) | River sorting of sediments.  | [3M] |
| b)   | What do you understand by minerals? How minerals are formed?                                   | [4M] |
| c)   | Describe the different types of unconformities and discuss the criteria for their recognition. | [4M] |
| d)   | Write notes on prevention, control and correction of landslides.                               | [3M] |
| e)   | Explain the necessities & importance of geophysical investigation.                             | [4M] |
| f)   | Explain the construction of a Gravity Dam?   | [4M] |

**PART -B**

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|------|--|------|
| 2 a) | Briefly explain the different types of physical and chemical weathering.   | [4M] |
| b)   | Explain in detail the geological work of Rivers  | [8M] |
| c)   | Discuss how geological studies can be utilized in civil engineering projects.  | [4M] |
| 3 a) | Differentiate between Gneiss and Schist.   | [3M] |
| b)   | Explain important physical properties of minerals that are commonly studied for their identification.  | [8M] |
| c)   | Explain the importance of:<br>i) Granite, ii) Quartzite iii) Shale, iv) slate and v) Schist.   | [5M] |
| 4 a) | How folds are classified? Explain with the help of neat sketch important types of folds as distinguished on the basis of a mode of occurrence. | [8M] |
| b)   | Geological structures and their significance in civil engineering projects.  | [8M] |
| 5 a) | Define ground water and hydrological cycle. Also explain water table and aquifers and its types.   | [8M] |
| b)   | Explain Earthquake magnitude, Earthquake Intensity, Earthquake focus and Earthquake tening.  | [8M] |
| 6 a) | What are the principles of geophysical exploration? Discuss any one method used for interpreting subsurface structures.                        | [8M] |
| b)   | Comment on seismic exploration techniques for site investigation in civil engineering projects and for water exploration.                      | [8M] |
| 7 a) | Explain with neat diagram favorable and unfavorable dips at a Tunnel site.   | [8M] |
| b)   | What is a dam? With what purposes it will be constructed? Explain in detail the geological investigations of a good dam site.                  | [8M] |

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**PART -A**

- 1 a) What is a river capture? Explain how it occurs. [3M]
- b) Explain physical properties of Calcite mineral. [4M]
- c) What is the difference between a normal and reverse fault? Explain with neat diagrams. [4M]
- d) What are different causes of Earthquakes? [3M]
- e) Explain the factors and methods of gravity. [4M]
- f) Tunneling in horizontal and folded rocks. [4M]

**PART -B**

- 2 a) Discuss three important adverse geological conditions that would require remediation during construction of buildings. [4M]
- b) Define weathering. Explain types of weathering and add a note on its importance. [8M]
- c) Define river and river system. Give a detail geological work of rivers. [4M]
- 3 a) Define cleavage and fracture of a mineral with examples. [3M]
- b) Describe following Rock properties in detail: (i) Basalt, (ii) Marble, (iii) Phyllite, (iv) Lime stone. [8M]
- c) Write notes on texture and Structures of metamorphic Rocks? Explain with a neat diagram. [5M]
- 4 a) Explain the following with neat sketches: (i) Dip and strike (ii) Parts of fold (iii) Mural Joints. (iv) Dome and Basin. [8M]
- b) Write short notes on the following with neat sketches: (i) Fan fold (ii) Columnar joints (iii) Angular unconformities and (iv) Radial faults. [8M]
- 5 a) Describe the Water Table and types of Ground Water. [8M]
- b) What are landslides? Discuss briefly their types, causes and preventive measures. [8M]
- 6 a) Write the importance of seismic refraction methods in civil engineering. [8M]
- b) Explain the principles used in the electrical resistivity and electrical SP methods of geophysical exploration. [8M]
- 7 a) Discuss the geological investigations that are carried out for Dam site selection. [8M]
- b) What are Dams and Reservoirs? Discuss the different types of dams giving geological reasons. [8M]

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**PART -A**

- 1 a) Distinguish between weathering and erosion. [3M]
- b) What is the difference between a batholiths and a stock? Explain with neat diagrams. [4M]
- c) Explain the following terms with neat sketches: i) Foot wall and Hanging wall and ii) Throw and Heave [4M]
- d) Discuss the following terms: (i) Focus and Epicentre, (ii) P- waves and S-waves. [3M]
- e) Describe seismic refraction survey to be conducted for determining the depth of bed rock. [4M]
- f) Explain silting of reservoir and its control. [4M]

**PART -B**

- 2 a) Explain the Branches of Geology? [4M]
- b) Describe in detail, the process of weathering of rocks. Add a note on the effect of weathering on the strength of rocks. [8M]
- c) Explain the role of geology in the field of civil engineering. [4M]
- 3 a) Bring out the differences between muscovite and biotite. [3M]
- b) Explain the engineering properties and description of Granite, Shale, Marble and Slate. [8M]
- c) Give a detailed account of the chemical composition, physical properties, origin, and uses of Feldspar group minerals. [5M]
- 4 a) Explain the following with neat sketches: (i) Open and closed folds, (ii) Graded Bedding, (iii) Current Bedding and (iv) Anticline and syncline. [8M]
- b) What are the reasons for folding? Discuss how a recumbent fold differs from a monocline fold and illustrate your answers with the help of neat sketches. [8M]
- 5 a) Enumerate the classification and causes of earthquakes and give their safety measures for construction of building in earthquakes prone areas. [8M]
- b) Classify landslides and discuss about the causative factors of landslides. Also, add a note on the measures for mitigation of landslides. [8M]
- 6 a) Give a detailed account of seismic surveys and interpretation of seismic data for subsurface investigation. [8M]
- b) Elaborate on the electrical methods used for sub-surface investigations. [8M]
- 7 a) Explain how faults and folds affect the choice of locations for dams and tunnels. [8M]
- b) Explain in detail about the role of geology on the design and construction of Reservoirs. [8M]

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